From: Joe Fontenot
To: Roos, Tom
Cc: Mark Simms; Jeremey Lay; Vicki Baker; Kim Cole (kim.cole@kimhec.com)
Subject: FW: City of Sioux City Eff TSS weekly average violation (NPDES 9778001) (Week of 012219 - 012819)
Date: Tuesday, February 05, 2019 8:35:29 AM
Attachments: Sioux City Upset (012219 - 012819).xlsx

Tom,

This is a follow up to last Monday's (1/28/19) email. (See below) Attached is a spreadsheet with all the eff data for January that I currently have. If you look at the band in yellow (1/22/19 – 1/28/19) you'll see where the problem started at the WWTP. We had several bad days (5 out of 7) that caused all the TSS weekly and monthly violations. TSS Weekly Avg. result was 160.8 mg/L with the weekly limit being 45 mg/L. TSS Weekly Avg. result was 16,078.14 Lbs/Day with the limit being 6,605 Lbs/Day. The bad week resulted in our monthly avg. being over limit as well. TSS Monthly avg. result was 50.8 mg/L with the monthly limit being 30 mg/L. TSS Monthly Avg. result was 5,078.53 Lbs/Day with the monthly limit being 4,404 Lbs/Day. All other weekly and monthly readings are in compliance.

We also sampled and ran Eff TSS testing on the post chlorination sample as well. It was consistently lower, as the CCC is capturing solids and preventing some solids from going to the river. If you look at the bottom of the spread sheet (about 4 rows up) you'll see 2 numbers in green. These are the total lbs discharged. The first number (112,546.97 lbs) is the lbs discharged from the sample point pre-chlorination. The second number (35,685.38 lbs) is the post chlorination number. This is a huge difference. The smaller number is what actually went to the river. The difference between them (76,861.59 lbs) is currently sitting in the bottom of our Chlorine Contact Chamber. This will be getting vacuumed out as soon as we stop losing solids and the plant stabilizes.

We are still not in routine/consistent compliance for TSS. We have had a couple of non-consecutive days in compliance and most of the rest have been out. We have 2 out of our 4 primary clarifiers on line, we are waiting on contractors to clean and repair the other 2 primaries. The reason for the problems with the primary clarifiers is mechanical stresses due to sudden changes in the depth and quantity of solids in the primaries following repeated heavy solids loading from outside sources. Heavy loadings have previously been documented from Big Ox Energy, with numerous violations of their IPP Permit and those violations have been frequently recurring. These loads caused damage to the flights and chains of the primaries.

The cold weather does not help treatment either. We have been dosing the final clarifiers with polymer, trying to drop the blankets lower but the polymer is less effective in the cold weather. We are doing everything we know to return the discharge to consistent NPDES Permit compliance, including the measures we have already outlined. We will be engaging a contractor to complete repairs to primary clarifiers 2 & 4 as soon as their scope is defined and they can mobilize.

We do have access to a portable belt press (once the contractors that are cleaning the P1 Digester are done with it). Once we have it we will start pulling solids from the splitter boxes feeding the final clarifiers and sending the solids to the landfill. If you have any concerns with this approach, please do let me know. I will update the test results as data becomes available and update you later in the

week.

Thank You,

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From: Joe Fontenot
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To: Roos, Tom <tom.roos@dnr.iowa.gov>
Cc: Mark Simms <msimms@sioux-city.org>; Jeremey Lay <jeremey.lay@BARTWEST.COM>; Kim Cole (kim.cole@kimhec.com) <kim.cole@kimhec.com>; Vicki Baker <vbaker@sioux-city.org>
Subject: City of Sioux City Eff TSS weekly average violation (NPDES 9778001) (Week of 012219 - 012819)

Tom,

As you probably know the Sioux City WWTP has been receiving the heavy loadings since the spring of 2018, but WWTP has been able to handle them for the most part until cold temperatures and equipment failures reduced our ability to do so. Below is a recap of the issues and problems that caused us to have permit violations starting late last week and through the weekend:

- Plant has been struggling to handle elevated solids loadings since mid-December or so.
- As a consequence of the heavy loadings during the late spring and early summer months, damage was caused to our primary clar's.
- During that period we had 1 primary out of service (#1), and were working to repair it and put it back into service.
- At roughly the same time we were ready to put it (#1) back into service another one failed (#3), while draining it for repair the remaining 2 failed as well (#2 & #4), all from heavy loadings and stress to the flights and chains while running under heavy load.
- So we have been running for several months with one repaired primary(#1) and 2 others drained and either being cleaned or being repaired (#3 & #4).
- We have had several delays in getting replacement parts for the primaries. Typical delivery times are 8 weeks when ordering parts.
- Solids levels were building in the Final clar's on the MLE side of the plant since none were being removed in the primary clar's, and the TWAS wasting pumps do not have the capacity to pump heavy sludge.
- Now a second primary is ready to go back into service following repairs (#3) this week.

- #4 was being cleaned to be repaired next and #2 was simply flowing through it with no mechanisms to remove solids, building up a blanket but taking some of the strain off of the other clar's.
- (01/24/19) we had a high Eff TSS result (from the day before's sample) – 56.4 mg/L - due to high loadings / Primary Clar's being down / TWAS pumps unable to pump volume needed / etc.
- Discussed situation with operations and had afternoon (3 – 11) shift start putting slugs of polymer into system using old powdered polymer going into splitter boxes that feed Final Clarifiers.
- That evening the afternoon shift operators found RDT tripped out, as it had done several times during the past week due to the loads going through it.
- Operators then tried to make room in wetwell by running TWAS pump in hand to get wetwell down.
- Wetwell pumped to bottom and pumps turned off.
- At this time there was a SCADA fault in the PLC cabinet.
- When a SCADA failure happens, whatever position the equipment was last in, whether on/off, whatever setpoints were in place at the time, etc. locks into position.
- In other words if the pumps were off, they stay off. If they were on, they stay on. Nothing changes until the PLC gives a command for it to change.
- So the operators were running around the yard resetting and restarting equipment. There is a priority to this based on importance. And unfortunately the RDT system and TWAS pumps are not considered as a priority.
- When they returned to the RDT building the pumps were still locked in the "OFF" position by the PLC and would not come back on, and as a consequence the wetwell had filled back up and overflowed into the basement.
- Wetwell overflowed into basement of RDT building, when level reached high enough (3 – 4"), ventilation system sucked up sludge from floor and it spilled out on top of the PLC panel in that building.
- This caused it to trip out and all equipment associated with it turned off as well. All the equipment, RDT's, polymer pump, TWAS pumps, valves to clar's, etc. had to be put in Local (Hand) mode for the rest of the night.
- Jon called and reported this to me on (01/24/19) around 8:45pm and asked permission to call in the night crew early to help with the clean up. Bryan and Leroy came in.
- Jose came out as well to check on it and he suspected that the UPS is shot and hopefully the PLC is OK. Sludge was still dripping down when he was here so he couldn't do anything else at that time.
- I was told the morning of 1/25/19 that about 99% of the mess was cleaned up and everything was still running in hand mode.
- All of these upsets on top of the already high solids caused us to have another high TSS today.
- Eff TSS result was 454.3 mg/L for 1/24/19, prior to disinfection, post disinfection it was 30 mg/L. CCC is capturing solids, so actual number to river is 30, not 454 mg/L.
- Have operators making up buckets of polymer solution and dumping into Final Clarifier splitter boxes to attempt and lower sludge blankets.
- Decided to put Primary #4 back into service even though it is nonfunctional to increase detention time and remove solids through settling.

Discussed with engineer about availability of contractors to come in and clean Primary Clar's #2 & 4 in emergency conditions due to compliance issues.

- Afternoon of 1/25/19 Jose completed repairs and got everything running back in automatic.
- Final Clarifier Blankets have dropped in Clar's 3 & 5 with the help of the polymer addition. They will continued the dosing for night shift and then backed off to hourly for the next day.
- Primary Clarifier #3 is going to be worked on tomorrow by Maintenance crew coming in on Saturday.
- TSS samples post chlorination will be run through end of month. Aware that numbers are not eligible for DMR reporting but at least we can show what actually left the plant, and put it in the comments.
- We will have to get chamber cleaned out sometime after everything is up in running.
- Eff TSS result was 439.0 mg/L for 1/25/19, prior to disinfection, post disinfection it was 43 mg/L. CCC is capturing solids. Will calculate mass lost from both locations to get an estimate of how much is in CCC.
- Blankets are reducing and effluent looks much better.
- Eff TSS result was 68.0 mg/L for 1/26/19, prior to disinfection, post disinfection it was 116 mg/L. CCC is capturing solids. Will calculate mass lost from both locations to get an estimate of how much is in CCC.
- Blankets are down around 5' in all final clarifiers polymer helping a lot.
- Eff TSS result was 9.3 mg/L for 1/27/19, prior to disinfection, post disinfection it was 80 mg/L. CCC is capturing solids. Will calculate mass lost from both locations to get an estimate of how much is in CCC.
- Plant no longer losing solids and ammonia results were in compliance for this whole period, BOD results will start tomorrow to go along with this time period (starting 1/24/19) we'll see how that plays out.
- After tomorrow's results we will have the final number for our 7-day average. If tomorrow's results are similar to today's then the 7-day average will be in the 150 mg/L area and the mass will be around 15,000 Lbs.
- We should also know if the BOD results are going to trend high. I will send another report when all results are available to sum everything up.
- The CCC will be cleaned out as soon as a contractor can be secured to do so and weather permits.
- Our chlorine delivery should be in tomorrow (1/29/19) and we will record Cl2 residuals as we do during the required months.
- Let us know if there is anything else you'd like us to do.

Thank You,

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